The Continuing Mismatch Between IT Governance Theory and Practice:

Results From a Delphi Study with CIO's

Research-in-Progress

Daniël Smits
University of Twente
d.smits@utwente.nl

Jos van Hillegersberg
University of Twente
j.vanhillegersberg@utwente.nl

ABSTRACT

Despite all efforts in the last decennium, IT governance continues to be a "top 10" issue for CIO's. The goal of our research program is to determine which disciplines and frameworks are used for IT governance and which streams in IT governance literature do best align with current practices. This study describes the results of a literature review and Delphi study of IT governance effectiveness and maturity and assesses the (mis)match between IT governance theory and practice. The Delphi study was conducted with a group of 14 CIO's of mid-sized and larger organizations. Based on the literature review and Delphi study, results show that six IT governance streams can be distinguished. We conclude that these six streams are an effective way to study the variety of IT governance practices. The study further concludes that there still exists a mismatch between IT governance theory and practice.

Keywords

IT governance, CIO, IT architecture, portfolio management, ISO 38500, Delphi study

INTRODUCTION

IT governance continues to be a "top 10" issue for CIO management. "IT governance continues to appear as an ongoing "top 10" CIO management issue in Gartner's annual EXP survey of CIOs", was the conclusion of Gartner analist Mahoney in the Executive Programs' worldwide survey of more than 2,300 CIOs (Mahoney, 2012).
IT governance is a relatively new topic. The first publications appeared in the late 1990's (Webb, Pollard and Ridley, 2006). While a considerable body of literature on IT governance exists, definitions of "IT governance" in the literature vary greatly (Webb, Pollard and Ridley, 2006; Lee and Lee, 2009). The underlying views can be clustered in several ways. For our research we adopt three views: IT governance as a framework or audit process, IT governance as IT decision-making and IT governance as a branch of corporate governance (Musson, 2009).
There are quite a lot of opinions on the question: "What exactly is IT governance?" (Webb, Pollard and Ridley, 2006; Lee and Lee, 2009). These opinions are sometimes coloured by the interests of suppliers or institutions. Moreover, researchers have suggested that a gap exists between theoretical frameworks and practice (Peterson, Parker and Ribbers, 2002).

Our research

The goal of our research program is to determine how to improve IT governance effectiveness and maturity. The goal of this study is to determine which streams in IT governance literature do best align with current practices and which disciplines and frameworks are used for IT governance.
In literature often constructs like dimensions, focus areas or principles are used to refine the concept of IT Governance. Dimensions may include IT Compliance Management or Business/IT Alignment (Novotny, 2012), examples of focus area's are value delivery or resource management (ITGI, 2003) and principles could be strategy or responsibility (ISO, 2008).

For applicability in practice we use the more practical term "discipline". Examples of disciplines are architecture or portfolio management which directly relate to roles or functions in an organization like architect or portfolio manager.

The goal of this study is to answer the following questions:
a. Which stream(s) of IT governance do best align with current practices?
b. According to practitioners, which disciplines should play an important role in IT governance?
c. Is there (still) a mismatch between IT governance practice and theoretical frameworks?

Our research process started with exploring the research domain through a detailed literature research in the domain of IT governance. As a next step we performed a Delphi study in a meeting with a group of 14 Dutch CIO's.

IT GOVERNANCE STREAMS

Scholars have different opinions on what exactly IT governance is. In our literature study we identified six streams based on two views. The first viewing angle handles about the scope of IT governance. The second viewing angle handles about the direction in which IT governance works.

Scope of IT governance

Different streams can be distinguished. Some use a small, others a broad scope.
Weill and Ross use of a small definition. They define IT governance as "… IT Governance is the decision rights and accountability framework for encouraging desirable behaviour in the use of IT." (Weill and Ross, 2004). Weill and Ross can be viewed as the main contributors to this stream that focuses on decision making. They look at IT governance from a decision making perspective. As components for IT governance, this stream uses elements like IT decisions or decision archetypes (Weill and Ross, 2004, 2005). Others complement this with the context in which the decision is made (Xue and Liang, 2008).
A clear proponent of the broad definition and founder of COBIT is the IT Governance Institute (ITGI). Currently however ITIL or ISO 20000 are the most frequently mentioned external frameworks used as a basis for IT governance (ITGI, 2011). Some researchers define IT governance "as the process by which decisions are made around IT investments" and claim ITIL V3 can provide a well matured framework for IT governance (Nabiollahi and Bin Sahibuddin, 2008).
In this study we use three streams of IT governance as a starting point: IT auditing, decision making and IT governance as integral part of corporate governance (Musson, 2009). At one end of the continuum, stress is put on corporate conformance. At the other end, is the concern with corporate performance (Bhimani and Soonawalla, 2005).
Since our research focuses on performance and not on conformance we need to differentiate between both parts of corporate governance. We define "corporate governance, *conformance* perspective" as related to rules and regulations and "corporate governance, *performance* perspective" as related to performance and value creation.

Working direction of IT governance

Most scholars see governance as a top down phenomenon. Often based on structures, planning and processes. Another view on IT governance is bottom up. To explain this view we make a side-step to institutional economics in which two contrasting worldviews coexist, which go all the way back to the eighteenth-century Enlightenment and can be described as top down or bottom up (Easterly, 2008).
The top down view of IT governance sees the governance of an organization as determined by the rules written by the management and leaders of the organization. The bottom up view sees IT governance as emerging spontaneously from the social norms, customs, traditions, beliefs, and values of employees within the organization in which the governance only formalizes what is already mainly shaped by the attitudes of individuals.
Followers of the second view often also criticize structural, top down, planning processes. Lindblom for example proposes an alternative to the analytical planning approach by "muddling through" with the argument real world problems are far too complex to solve this way (Lindblom, 1959). Rosenberg suggests that technology can be strategy generating, because it induces managers to focus on new directions regarding, for example, product innovation (Ciborra, 1997). Schwarz and Hirscheim (2003) have found that IT executives should approach their governance structures as 'an architecture'. Instead of formalized hierarchies an architecture "create spaces that are designed to provide the resources that employees need to offer their 'customers' the best possible service", "Our results suggest that researchers need to change their views of IT 'structure' to embrace a more social and dynamic existence.". Dietz and Hoogervorst (2012) use the designation distributed governance to make clear that the involvement of the employee should include governance.

This results in four IT governance streams for the first view (scope) and two IT governance streams for the second view (direction) as are summarized in table 1.

View	IT governance stream
Scope	1. IT Audit
	2. Decision making
	3. Part of corporate governance, conformance perspective
	4. Part of corporate governance, performance perspective
Direction	A. Top down
	B. Bottom up

Table 1 IT governance streams

IT GOVERNANCE FRAMEWORKS

Some of the frequently cited frameworks are: COBIT, ITIL, ISO/IEC 27001, ISO/IEC 17799 and BS 7799 (Musson, 2009). The frameworks which are used for IT governance vary a lot as can be seen in different survey's from the ITGI which are summarized in table 2 (ITGI, 2008, 2011).

Framework	2011	2008	2006
ITIL or ISO 20000	28 %	24 %	13 %
ISO 17799, ISO 27000 or other security frameworks	21 %	10 %	9 %
Six Sigma	15 %	2%	5 %
COBIT (ISACA)	13 %	14 %	9 %
PMI/PMBOK	13 %	1 %	3 %
Risk IT (ISACA)	12 %		
IT Assurance Framework (ISACA)	10 %		
CMM or CMMI	9 %	4 %	4 %
ISO 38500	8 %		
BMIS (Business Model for Information Security, ISACA)	8 %		
PRINCE2	6 %	2 %	
Val IT (ISACA)	5 %		
TOGAF	3 %		
COSO ERM	2 %	1 %	4 %

Table 2 Use of IT governance frameworks

With 10% grow for Six Sigma, 10% grow for PMI/PMBOK, 11% grow for security, 4% grow for ITIL, 3 % grow for TOGAF (from 0), 1% decrease for COBIT in a period of three years there is no clear leader. Furthermore it shows that more general frameworks like Six Sigma are fast growers too.

The relation with project and portfolio management frameworks like PMI/PMBOK, PRINCE2 and architecture frameworks like TOGAF can be illustrated with cases found in academic research in which IT governance is implemented using portfolio management and architecture (Wittenburg, Fisher and Hallermeier, 2007).

COBIT uses a classification which consists of five focus areas: strategic alignment, value delivery, resource management, risk management, performance measurement. In COBIT 5.0 the concepts and ideas contained in these focus areas are maintained and built upon in the framework, but the focus areas themselves have not been literally maintained (Bernard, 2012; COBIT 5.0, 2013).

Another well-known classification is the trichotomy of Peterson: structures, processes and relational mechanisms (Peterson, O'Callaghan and Ribbers, 2000; De Haes, 2005). Quite practical but as Willson and Pollard (2009) has shown IT governance is not limited to structures, processes and mechanisms but also relies on complex relationships, between history and present operations.

The ISO/IEC 38500 is an international standard for IT governance. The standard defines six principles for directors and top management which are: responsibility, strategy, acquisition, performance, conformance, human behavior (ISO, 2008).

A recent literature survey by Novotny, Bernroider and Koch (2012) on dimensions and operationalization's of IT governance reveals nine IT Governance dimensions which are listed in table 3.

Dimension	
Input	IT Compliance Management
	IT Risk Management
	IT Decision Authority and Responsibility
	IT Performance and Quality Measurement
	IT Investment Management
	IT Resource and Capability Management
	IT Governance Improvement
Output	Business/IT Alignment
	Business Value Delivery

Table 3 Dimensions of IT Governance (Novotny, 2012)

Four dimensions are clearly complementary to the focus areas of COBIT: compliance management, decision authority and responsibility, investment management and governance improvement.

DELPHI STUDY SETUP

Delphi may be characterized as a method for structuring a group communication process so that the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem (Linstone and Turoff, 2002). Our approach is to develop our initial theories by listening to experts from business. “For this type of exploratory, theory-building research, a Delphi study is an appropriate research design” (Akkermans, Bogerd, Yücesan and Van Wassenhove, 2003).
To accomplish this "structured communication" several elements should be provided: some feedback of individual contributions of information and knowledge; some assessment of the group judgment or' view; some opportunity for individuals to revise views; and some degree of anonymity for the individual responses (Linstone and Turoff, 2002).
Careful selection of participants is important “since the quality and accuracy of responses to a Delphi panel are only as good as the expert quality of the participants who are involved in the process.” (Linstone and Turoff, 2002; Taylor-Powell, 2002). With 14 participants we also comply to the next guideline: “Ten to 15 people may be adequate for a focused Delphi where participants do not vary a great deal.” (Taylor-Powell, 2002).
Earlier research of the ITGI showed CIO’s and IT management to be the best party to ask questions about IT governance: “Although championship for IT governance within the enterprise comes from the C-level, in daily practice IT governance is still very much a CIO/IT director issue.” (ITGI, 2008).

Technical details of the Delphi study

The Delphi study was conducted during a meeting of the CIO platform Netherlands (CIOPN). The CIOPN counts more than 100 members and delivers a good reflection of the Dutch situation within government and private enterprises. To become a member of the CIOPN the organization must count at least 1000 employees, have a sales volume of € 500 million and/or an IT budget of more than €25 million. For governmental organizations no specific sales volumes are required.
This means that the participants of the Delphi meeting can be characterized as fourteen Dutch CIO’s responsible for IT budgets larger than € 25 million. The attendees provided a well balanced mix from different branches (table 4).

Attendee #	**Type of organization**	**Attendee #**	**Type of organization**
1	Agriculture	8	Retail
2	Hospital	9	Power company
3	Heavy Industry	10	Seaport
4	Wholesale	11	Health Insurer
5	Engineering	12	City
6	Chemical Industry	13	Public Health Care
7	Non-profit	14	Finance

Table 4 Meeting attendance

During the meeting

Different people often have different understandings of the same concept. To address this we first presented and explained what IT governance is using the six IT governance streams.
To support the Delphi study the innovative tool Spilter by Canast was used. Spilter is a user-friendly, web-based, Group Decision Support System also called a Group Decision Room.
All participants present during the meeting were asked to bring a laptop or tablet. For each CIO a login name was created and as a group we discussed a list of ten questions. For discussion purposes all results were also presented by a beamer on a projection screen.
Each participating CIO has to respond to questions and statements using their keyboard. Most of the time everyone responds at the same time for the same question. There is no hierarchy or dominance, each opinion counts and can be recorded. Where needed responses can be anonymous.
After explaining a question we asked the group to add their response. Where applicable, for example when asked to rate the streams, we used Spilter to show graphs of the results after all responses were given.
For some questions, for example when asked to enter disciplines, responses are shared. Eeach participant is shown all responses in stead of only his own. Participants could add his own responses or adopt them from the group list. In advance we defined a maximum number of responses for each question.
It was planned to cluster the responses but for reasons of lack of time this was done manually afterwards by the researchers.

RESULTS

From the participating CIO's 57% report to the CFO and 21% to the CEO. Of the remaining three CIO's: one reported to the COO, one was a member of the Board of Directors and the third has the function of CTO (table 5).

As a CIO I report to:		
CEO	3	21%
CFO	8	57%
COO	1	7%
Otherwise	2	14%
Total	**14**	**100%**

Table 5 Reporting line

When questioned to rate the effectiveness of their current IT governance practice anonymously 29% of the CIO's rate it as sufficient (grade = 6; 10 = excellent, in the Netherlands). An even larger group of 65% rate it as good (grade = 7 or 8). Only one CIO rated it as poor (grade = 3) and did not answer the rest of the questions.

On behalf of our second research question we questioned the CIO's to rate the current IT governance implementation for the first four IT governance streams. The answers of the CIO's vary a lot (table 6).

#	IT Auditing	Decision making	Conformance	Performance
Min	5 %	10 %	10 %	10 %
Max	50 %	60 %	50 %	70 %
Mean	18 %	33 %	22 %	27 %

Table 6 Views on IT Governance Implementation (regarding scope)

Furthermore we questioned about the direction of the implementation, the last two streams.
Five answers were possible: "Completely top down", "Largely top down", Mixed, "Largely bottom up" or "Completely bottom up" and a free format field for motivation (table 7).

Completely top down	Largely top down	Mixed	Largely bottom up	Completely bottom up
0 %	46 %	38 %	15 %	0 %

Table 7 Working direction of IT governance

As a part of the third research question we asked "Which disciplines play an important role for IT governance in your opinion?". We added three examples of disciplines (architecture, portfolio management and IT management) to explain what we mean with disciplines. The nonsense and too generic answer "IT management" was added to the examples and accurately detected by each of the CIO's. None of them added this discipline to his list.
The results are summarized in table 8. The most often mentioned disciplines are portfolio management and architecture which were mentioned by 62% and 46% of the CIO's.

Discipline	Number of times mentioned	%
Portfolio management	8	62%
Architecture	6	46%
Security	4	31%
Project and program management	4	31%
Demand management	3	23%
Innovation	3	23%
Process design and management	3	23%

Table 8 Important disciplines for IT governance according to the CIO's

Thirteen CIO's answered the next question "What has to be done to improve IT governance in your opinion?". Six of them also prioritized the results.

Group	What has to be done to improve IT governance?	1	2	3	4	5	6	7	Total	%
Responsibility	Good ownership of processes and corresponding applications	3					1	1	5	29%
	IT fixed on agenda board, with IT present. BPO assigned on senior level on key processes by the bo	1		1		1			3	
	Process owners (having)			1		1		1	3	
	Confront business with the consequence of their choices		1						1	
Strategy	Formally approved information management strategy			1			1	1	3	7%
Performance	Maturity benchmark		1		1		1	1	4	29%
	Consider ICT as a part of a business project. For infrastructure too!			1	2				3	
	Determine the fundament: ict is yield driven and not cost driven.	1				1		1	3	
	Agile it					1			1	
	Lean it						1		1	
Conformance	The CIO role must disappear in favor of a control instrument			1					1	2%
Human Behaviour	Educate business managers		3			1			4	29%
	Professionalize the client (NL: opdrachtgeverschap)			1	1		1		3	
	Communicate and collaborate; business result first				1	1			2	
	More discipline, observe engagements	1							1	
	Observe engagements							1	1	
	Responsibility push towards business owners		1						1	
Not grouped	Simplification						1		1	5%
	Usergroups				1				1	
	*13 of the 14 CIO's did answer the question, 6 also prioritised.								42	100%

Table 9 Actions to improve IT governance

The answers are categorized using the six principles of ISO 38500 which are Responsibility, Strategy, Acquisition, Performance, Conformance, Human Behaviour.
The highest scores received "Good ownership of processes and corresponding applications", "Maturity benchmark" and "Education of business managers". Ownership is seen as especially important by all six. Due to double answers this was also repeated in "(Having) Process owners" and "Responsibility push towards business owners".

On the question "Do you want to be kept informed on the results of the research?" all CIO's responded positive.

DISCUSSION

The current IT governance implementation is self-appraised by the CIO's as sufficient or better (with one exception). This was a surprise. However it is possible that self-rating results in more positive appraisal than an objective evaluation by an independent third party. The discussion is set upon our three research questions:

Research question a. "Which stream(s) of IT governance do best align with current practices?"

None of the CIO's rate any of the scope streams at 0%, which means all four streams are seen as relevant by the CIO's.
When asked for the working direction of IT governance none of the CIO's choose one of the extremes ("completely top down" or "completely bottom up"), which means that both are seen as relevant too. Our research further reveals that on what is most important the CIO's have different opinions.
So all six IT governance streams are seen as relevant. As such a broad definition of IT governance best aligns with current practices.
Mixed or largely bottom up was chosen by 54% of the CIO's which means more than half of the group think bottom up is at least the same or even more important than top down. Current IT governance approaches are mostly top down.
That none of the CIO's choose completely top down or completely bottom up and the relative high score of 54% for mixed or largely "bottom up implementation" relevance can be seen as a confirmation of the opinions of critics on current top down approaches.

Research question b. "According to practitioners, which disciplines should play an important role in IT governance?"

The disciplines which are most often mentioned are portfolio management and architecture with respectively 62% and 46%. The Delphi study confirms that the participating CIO's agree on the relevance of these disciplines and encourage this direction for our research program. The extra disciplines that were put forward by the CIO's give us input for additional research.
It is interesting to see that the resulting answers to the next question: "What has to be done to improve IT governance?" did not quote disciplines (table 9). Improvement of portfolio management, architecture, security, project management, program management or innovation were not mentioned. This might be explained as there are other issues for improvement besides disciplines with higher priorities.
The subjects which were mentioned are of a completely different kind. Most answers (86%) can be categorized as part of: responsibility, performance and human behavior. The highest score for "Good ownership of processes and corresponding applications" shows there are still issues regarding responsibilities and accountabilities. Being one of the core issues of IT governance this seems a little contrary to the high scores for the rating of the IT governance practices. More research in what lies behind is needed.
The mentioning of the need for a "Maturity benchmark" can be seen as a confirmation of the relevance of the maturity part of our research program. Further research is needed to determine why they don't use existing maturity benchmarks for IT governance. The high score for "Education of business managers" shows there are still issues in the collaboration between business and IT management.

Research question c. "Is there a mismatch between IT governance practice and theoretical frameworks?"

Comparing the resulting disciplines with the results of the ITGI survey's (table 2) there are a few things that attract attention. Service management (ISO 20000 / ITIL) was ranked top of the ITGI lists, while in our results it was only mentioned twice.
Portfolio management, architecture, security and project and program management are the most frequently mentioned disciplines. PMI/PMBOK en PRINCE2 deal with project, program and portfolio management which are fast growers in the ITGI survey too. Architecture has a clear link with TOGAF which got a no longer negligible percentage of 3% in the ITGI survey of 2011. Security was in the top four in our research. Several security frameworks like ISO 17799/27000 are indeed used as the second most frequently used frameworks for IT governance in practice (ITGI, 2011).
So we can see there is a substantial correspondence between the mentioned disciplines and the frameworks used in practice. These disciplines however deviate from a conventional list of dimensions (table 3). Some disciplines can be used to implement some of the dimensions. An example is IT investment management or resource management using portfolio management. So dimensions, disciplines and frameworks do not match.
Demand management, innovation and process design and management can only be related to the more general frameworks.

The interest of the CIO's for the research is a confirmation for the relevance of our research program. The need for a "Maturity benchmark" is a welcome confirmation for the relevance of the maturity part of our research program.

CONCLUSIONS

The research goal of the study was to determine if there is still a mismatch between IT governance practices and theory. To answer this question we defined three sub questions. The conclusions are grouped around these questions.

Which stream(s) of IT governance do best align with current practices?
We defined six IT governance streams. Four streams defining the scope of IT governance. IT governance can be seen as an audit process, as IT decision-making, as an integral part of corporate governance from a conformance perspective and as an integral part of corporate governance from a performance perspective. Two streams defining the direction in which IT governance works top down or bottom up.
Our results show that IT governance is a broad working field in which all six stream's (as shown in table 1) are seen as relevant. Mixed or largely bottom up was chosen by 54% of the CIO's which means more than half of the group think bottom up is at least equally or even more important than top down. Current IT governance approaches are mostly top down.
We conclude that a broad definition of IT governance best aligns with current practices and that these six streams are an effective way to study the variety of IT governance practices.

According to practitioners, which disciplines should play an important role in IT governance?
In literature often constructs like dimensions as shown in table 3, focus areas (COBIT) or principles (ISO 38500) are used. For recognition in practice we use the more practical term discipline. The most often mentioned disciplines are portfolio management and architecture which were mentioned by 62% and 46% of the CIO's (table 8).
When asked what has to be done to improve IT governance the disciplines did not show up again. The highest scores received "Good ownership of processes and corresponding applications", "Maturity benchmark" and "Education of business managers".

Is there (still) a mismatch between IT governance practice and theoretical frameworks?
We conclude there is a substantial correspondence between the mentioned disciplines and the frameworks used in practice. These disciplines however deviate from a conventional list of dimensions (table 3).
There is no clear match between the disciplines and the frameworks used in practice too. Because dimensions, disciplines and frameworks do not match we conclude it seems most likely there is still a mismatch between IT governance practice, frameworks and theory.

Future research
The resulting list of disciplines is also used in the next steps of our research program. To create a starting set for improving IT governance we need a bifurcation of IT governance in a set of components which are recognized in practice. The collected disciplines will be used as a starting set of components.
The next step is determining the collection of capabilities to improve IT governance. During this step the components and capabilities of IT governance will be determined using a focus group. Additional research will be done on the use and effectiveness of current IT governance maturity models and on approaches for bottom up IT governance.

REFERENCES

- Akkermans, H. A. Bogerd P. Yücesan E. Van Wassenhove L.N. (2003) The impact of ERP on supply chain management: exploratory findings from a European delphi study. *European Journal of Operational Research*, *146*, 284–301.
- Bernard P. (2012) COBIT 5 - A management guide, Van Haren Publishing, ISBN 9789087537012
- Bhimani A., Soonawalla K. (2005) From conformance to performance; The corporate responsibilities continuum, *Journal of Accounting and Public Policy*, Volume 24, Issue 3, 165–174
- Ciborra C.U. (1997) De Profundis? Deconstructing the Concept of Strategic Alignment, *Scandinavian Journal of Information Systems*, 9(1):67–82
- COBIT 5.0 (2013) website: http://www.isaca.org/cobit/
- De Haes, S., Van Grembergen, W. (2005) IT Governance Structures, Processes and Relational Mechanisms: Achieving IT/Business Alignment in a Major Belgian Financial Group, *Proceedings of the 38th Annual Hawaii International Conference on* , vol., no., pp. 237b, 03-06 Jan. 2005

- Dietz, J.L.G., Hoogervorst J.A.P. (2012) Principles of Enterprise Engineering, Advances in Enterprise Engineering VI, Berlin Heidelberg, Springer, pp. 15-30
- Easterly, William. (2008) Design and Reform of Institutions in LDCs and Transition Economies Institutions: Top Down or Bottom Up?, *American Economic Review: Papers & Proceedings*, 98:2, 95–99
- ISO/IEC 38500 (2008) International Standard for Corporate Governance of IT (IT Governance)
- ITGI (2003) Board Briefing on IT Governance, Second Edition. Retrieved January 27 2005 from www.itgi.org
- ITGI (2008) IT Governance Global Status Report – 2008, IT Governance Institute, Meadows, IL, US.
- ITGI (2011) Global Status Report on the Governance of Enterprise IT (GEIT) – 2011, IT Governance Institute, Meadows, IL, US.
- Lee, Junghoon and Changjin Lee. (2009) IT Governance-Based IT Strategy and Management: Literature Review and Future Research Directions. *Information Technology Governance and Service Management: Frameworks and Adaptations*. IGI Global. 44-62.
- Lindblom, CE. (1959) The science of muddling through, Public administration review, JSTOR
- Linstone, H. A., & Turoff, M. (2002) *The Delphi Method: Techniques and Applications*. Reading, MA: Addison-Wesley Publishing Company.
- Mahoney J. (2012) Briefing for IT Leaders: Tomorrow's Trends and Today Decisions, Gartner.
- Musson, David. (2009) IT Governance: A Critical Review of the Literature. *Information Technology Governance and Service Management: Frameworks and Adaptations*. IGI Global. 63-81.
- Nabiollahi, Akbar; bin Sahibuddin, Shamsul, (2008) "Considering service strategy in ITIL V3 as a framework for IT Governance," *Information Technology. ITSim 2008. International Symposium on* , vol.1, no., pp.1-6, 26-28 Aug. 2008
- Novotny, Alexander; Bernroider, Edward W.N.; and Koch, Stefan, (2012) Dimensions and Operationalisations of IT Governance: A Literature Review and Meta-Case Study. *CONF-IRM 2012 Proceedings*. Paper 23.
- Peterson, R., Parker, M. M., & Ribbers, P. (2002) Information Technology Governance Processes under environmental dynamism: investigating competing theories of decisionmaking and knowledge sharing. In *Proceedings of the 23th International Conference on Information Systems*, December 15–18 2002, Barcelona, Spain.
- Peterson, R.R., R. O'Callaghan, and P.M.A. Ribbers. (2000) Information technology governance by design. *Proceedings of the International Conference on Information Systems (ICIS)*, Brisbane, Australia.
- Schwarz, A., R. Hirschheim. (2003) An extended platform logic perspective of IT governance: managing perceptions and activities of IT, *The Journal of Strategic Information Systems*, Volume 12, Issue 2, Pages 129-166.
- Spilter, website: http://www.spilter.nl/
- Taylor-Powell, E. (2002) *Quick tips collecting group data: Delphi technique*, University of Wisconsin , on-line available at http://www.uwex.edu/ces/pdande/resources/pdf/Tipsheet4.pdf.
- Webb, P and Pollard, C and Ridley, GJ. (2006) Attempting to Define IT Governance: Wisdom or Folly?, *Proceedings of the 39th Annual Hawai'i International Conference on System Sciences*, Hawai'i, pp. Track 8, p.194a.
- Weill, P. and Ross, J. (2005) A Matrixed Approach to Designing IT Governance, *MIT Sloan Management Review*, (46)2, pp. 26-34.
- Weill, P. and Ross, J. (2004) *IT Governance: How Top Performers Manage IT Decision Rights for Superior Results*. Boston: Harvard Business School Press.
- Willson, P., & Pollard, C. (2009) Exploring IT governance in theory and practice in a large multi-national organisation in Australia. *Information Systems Management*, *26*(2), 98-109.
- Wittenburg, A., Matthes, F., Fischer, F. and Hallermeier, T. (2007) Building an integrated IT governance platform at the BMW Group, *Int. J. Business Process Integration and Management*, Vol. 2, No. 4, pp.327–337.
- Xue, Y. J., Liang H. G., and Boulton W. R. (2008) Information Technology Governance in Information Technology Investment Decision Processes: The Impact of Investment Characteristics, External Environment, and Internal Context, MIS Quarterly, 32(1), 67-96.